

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

TRANSLATION
PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

To:

Date of mailing **See form PCT/ISA/210**
(day/month/year)

Applicant's or agent's file reference
0000055241

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/EP2005/000308

International filing date (day/month/year)
14.01.2005

Priority date (day/month/year)
21.01.2004

International Patent Classification (IPC) or both national classification and IPC
C07D307/60, C08F2/22, C14C11/00, D06M13/10, D21H17/16

Applicant
BASF Aktiengesellschaft

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/EP

Authorized officer

Facsimile No.

Telephone No.

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PCT/EP2005/000308

Box No. I

Basis of this opinion

1. With regard to the language, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
☐ This opinion has been established on the basis of a translation from the original language into the following language
_____, which is the language of a translation furnished for the purposes of international search (under Rule 12.3 and 23.1(b)).
2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material
☐ a sequence listing
☐ table(s) related to the sequence listing
 - b. format of material
☐ in written format
☐ in computer readable form
 - c. time of filing/furnishing
☐ contained in the international application as filed.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

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Box No. V	Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement																													
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<p>2. Citations and explanations:</p> <p>D1 EP 0 593 075</p> <p>D2 DE 102 48 879 (only if priority document not valid)</p> <p>D3 K. Landfester, Macromol. Rapid Comm., <u>22</u>, 896-936 (2001)</p> <p>D4 EP 0 228 801</p> <p>D5 JP 632 64 557</p> <p>D6 US 6 162 328</p> <p> 1. <u>Novelty - PCT Article 33(2)</u></p> <p>Aqueous emulsions of alkenylsuccinic anhydrides are known from the prior art as pulp sizing agents for paper (D1, D4) ..</p> <p>Aqueous dispersions comprising alkyldiketenes are known from the prior art through miniemulsion polymerization of hydrophobic monoethylenically unsaturated monomers in the presence of alkyldiketenes (D2) .</p> <p>Miniemulsion polymerization is described in D3.</p> <p>Alkenylsuccinic anhydrides and alkyldiketenes are known as alternative surface sizing agents (D5-D6) .</p>																														

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Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement

None of the aforementioned documents discloses aqueous polymer dispersions comprising alkenylsuccinic anhydrides. Consequently novelty is acknowledged for the subject matter of claims 1 to 18.

2. Inventive step - PCT Article 33(3)

Alkenylsuccinic anhydrides are already known as sizing agents in the form of aqueous emulsions, from **D1**, but are not known as an active part of aqueous polymer dispersions (as in the present application). The problem addressed by the present application is that of providing new formulations based on alkenylsuccinic anhydrides that exhibit enhanced stability as compared with the aqueous alkenylsuccinic anhydride emulsions known from the prior art (**D1**, **D3**). The solution are polymer dispersions comprising alkenylsuccinic anhydrides that are prepared by miniemulsion polymerization of hydrophobic monoethylenically unsaturated monomers in the presence of alkenylsuccinic anhydrides.

2.1 Only a single polymer dispersion based on alkenylsuccinic anhydrides, styrene, acrylic acid and n-butyl acrylate has been prepared. No determination of the degree of performance has been indicated. The application does not contain any comparative examples in the absence of alkenylsuccinic anhydrides. Nor are there any performance examples, such as a test as surface sizing agents, for example. Since the technical effect has not been demonstrated and since alkenylsuccinic anhydrides have not been shown to be an essential

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feature, no inventive step is acknowledged. Evidence ought to cover the entirety of the range of protection claimed. At the present time it is restricted to styrene and alkenylsuccinic anhydrides, with other monomers (acrylic derivatives) being present only in the sole example.

2.2 The advantages of a miniemulsion polymerization for stabilizing an emulsion are known from **D3**, page 899, column 2.2 and figure 9. Alkenylsuccinic anhydrides are known to a person skilled in the art as surface sizing agents (**D5-D6**). In the light of the teaching from **D1** the proposed solution is considered obvious in relation to **D3**. No inventive step could therefore be acknowledged.

3. Clarity

Claims 1 to 7 fail to meet the requirements of PCT Article 6. In the claims an attempt is made to characterize the product, aqueous polymer dispersions comprising alkenylsuccinic anhydrides, by means of a process for their preparation. Any such definition can only be accepted in accordance with the conditions developed in PCT Guidelines CIII - 4.7b, i.e. the product must be novel and inventive *per se* (see section 2. above).